IN THE CLAIMS:

Please cancel claims 1, 7, 14, and 17. **Please also amend** claims 2-6, 8-13, 15, 16, and 18-20, **and add** new claims 21-24, as shown in the complete list of claims that is presented below.

Claim 1 (cancelled).

2. (currently amended) A watermark information embedding apparatus, comprising:

a document image generating section for generating a document image;

a PN code generating section for generating <u>at least one</u> PN code;

a watermark image generating section for ~~diffusing prescript~~ <u>representing units of</u> watermark information [[by]] using the <u>at least one</u> PN code, generating ~~diffusing~~ <u>representational</u> watermark information, and generating a watermark image in which the ~~diffusing~~ <u>representational</u> watermark information is denoted by dot pattern<u>s</u>; and

a synthesizing section for overlapping the document image and the watermark image so as to generate a ~~containing watermark~~ <u>watermarked</u> document image.

3. (currently amended) The watermark information embedding apparatus according to Claim 2, wherein ~~the PN code generating section generates at least one PN code, and~~ the watermark image generating section utilizes the at least one PN code to ~~diffuse~~ <u>represent</u> the ~~prescript~~ watermark information with respect to row unit<u>s</u> or column unit<u>s</u>.

4. (currently amended) The watermark information embedding apparatus according to Claim 2, wherein the PN code generating section generates <u>at least one</u> two-dimensional PN code which is different from or [[is]] <u>the</u> same ~~with that representing~~ <u>a</u> row direction and <u>a</u> column direction<u>.</u> ~~respectively.~~

5. (currently amended) A watermark information embedding apparatus comprising:

a document image generating section for generating a multipage document image;

a PN code generating section for generating two dimensional PC codes that together form a three-dimensional PN code which is different from or [[is]] the same in a with that representing row direction, a column direction, and a page direction respectively; the PN code generating section generating two-dimensional PN code which is configured by PN codes with respect to row direction and column direction according to prescript watermark information;

a watermark image generating section for using the two-dimensional PN codes to diffuse the prescript represent units of watermark information so as to generate the watermark image of one page, and using the PN code in the page direction to diffuse on a sequence of representational watermark pages so as to generate [[the]] a multipage watermark image; and

a synthesizing section for overlapping the multipage document image and corresponding watermark image so as to generate a containing watermark watermarked document image.

6. (currently amended) The watermark information embedding apparatus according to Claim 2, wherein the multiple dot pattern are configured in one surface, and wherein there is at least one [[a]] dot pattern representing special watermark information.

Claim 7 (cancelled).

8. (currently amended) A watermark information detecting apparatus for extracting units of watermark information, which is diffused are represented by at least one PN code and represented as in a watermark image, from a document, comprising:

a watermark information detector, the watermark information detector extracting the watermark image from the document, and estimating an area [[of]] occupied by the watermark information via calculating correlation between based on the watermark image and the at least one PN code.

9. (currently amended) The watermark information detecting apparatus according to Claim 8, wherein the watermark information detector discriminates whether the watermark information is correctly detected according to at least one correlation peak value of the at least one PN code. ~~code, if the watermark information can't be detected correctly, the watermark detector performing prescript correction.~~

10. (currently amended) The watermark information detecting apparatus according to Claim 8, wherein the watermark information detector calculates correlation values using different PN codes, detects a correlation peak value of each PN code, and estimates row addresses and column addresses according to the correlation peak values.

11. (currently amended) The watermark information detecting apparatus according to Claim 8, wherein the watermark information detector calculates a correlation of two-dimensional PN codes, which ~~includes~~ include different ~~kinds of~~ PN codes in a row direction and a column direction, ~~respectively,~~ so as to estimate the area [[of]] occupied by the watermark information.

12. (currently amended) The watermark information detecting apparatus according to Claim 8, wherein the document is ~~composed by~~ a multipage document, and wherein the watermark information detector calculates a correlation of three-dimensional PN codes, which ~~includes~~ include different ~~kinds of~~ PN codes ~~with respect to~~ in a row direction, a column direction, and a page direction, so as to estimate the area [[of]] occupied by the watermark information.

13. (currently amended) The watermark information detecting apparatus according to Claim 8, ~~wherein the multiple dot pattern are configured in one surface, and~~ wherein there is at least [[a]] one dot pattern representing special watermark information.

Claim 14 (cancelled).

15. (currently amended) A method of embedding watermark information, comprising:

generating a watermark image ~~through utilizing~~ using a watermark information embedding apparatus to ~~diffuse prescript~~ represent units of watermark information by at least one PN code;

~~synthesizing~~ combining the watermark image and ~~prescript~~ a document image so as to generate ~~the synthesized~~ a combined image; and

outputting the ~~synthesized~~ combined image.

16. (currently amended) The method of embedding watermark information according to Claim 15, ~~wherein the multiple dot pattern are configured in one surface, and~~ wherein there is at least [[a]] one dot pattern representing special watermark information.

Claim 17 (cancelled).

18. (currently amended) A method [[of]] for detecting watermark information using ~~for utilizing~~ a watermark information detecting apparatus to extract units of watermark information, which ~~is diffused~~ are represented by at least one PN code ~~and represented as~~ in a watermark image, from a document, the method comprising the steps of:

(a) extracting the watermark image;

(b) calculating at least one correlation between the watermark image and the at least one PN code; and

(c) estimating [[the]] an area [[of]] occupied by the watermark information according to ~~previous~~ steps (a) and (b).

19. (currently amended) The method of detecting watermark information according to Claim 18, ~~wherein the multiple dot pattern are configured in one surface, and~~ wherein there is at least [[a]] one dot pattern representing special watermark information.

20. (currently amended) A method for generating a ~~containing watermark~~ watermarked document comprising:

generating a watermark image by using <u>at least one</u> PN code to ~~diffuse prescript~~ <u>represent units of</u> watermark information; and

~~synthesizing~~ <u>combining</u> the watermark image and ~~prescript~~ <u>a</u> document <u>image</u>.

21. (new) The method of Claim 20, wherein the units of watermark information are bits of watermark information.

22. (new) The method of Claim 20, wherein the at least one PN code includes a particular PN code and another PN code having bits that are inverted from the bits of the particular PN code.

23. (new) The watermark information embedding apparatus according to Claim 2, wherein the units of watermark information are bits of watermark information.

24. (new) The watermark information embedding apparatus of Claim 2, wherein the at least one PN code includes a particular PN code and another PN code having bits that are inverted from the bits of the PN code.